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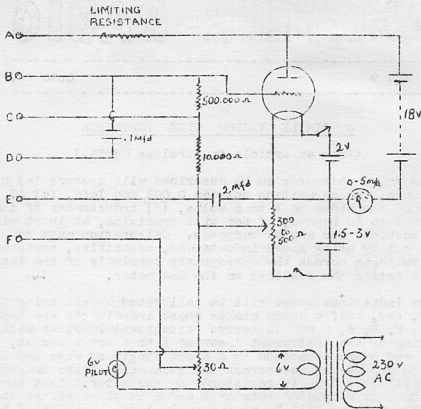
A SIMPLE VACUUM TUBE VOLTMETER

(From an article in Wireless World.)

The valve voltmeter to be described will measure (a) high resistances, (b) capacities between 0.001 and 1mfd, (c) AC voltage of the order of 1 to 5 volts, (d) inductances of the order of 1 to 10 henrys, if not with precision, at least with enough accuracy for normal purposes. Calibration must be carried out by using known inductances, capacities, resistances and AC voltages across the appropriate terminals of the instrument and noting the readings on the 5ma meter.

The inductance range will be calibrated by obtaining the loan of, say, half a dozen chokes whose inductances are known to be 1, 2, 4, 6, 8 and 10 henrys respectively. First with the mains plug of the instrument inserted into a power socket, terminals F and B are connected by a short length of wire and the slider on the resistance across the secondary of the Transformer moved until just 5 ma is registered on the meter. Next the 10 henry choke is connected between F and B in place of the shorting wire. The reading will be considerably less. Next the 8 henry choke is connected and the new reading noted, and so on with the other chokes. A graph is then constructed plotting henrys against ma. The capacity range is calibrated in exactly the same way. For the high resistance range, using terminals A and B it is sufficient to calibrate with ordinary commercial resistors of good make up to 5 megohms. The AC voltage range, using terminals D and E, is calibrated against an AC voltmeter.

Great accuracy is obviously not to be expected of this simple instrument, but as the tolerances are considerable in the usual commercial receiver components, it will provide a fairly reliable check. For example the leakage resistance of a condenser is tested by connecting the condenser across terminals A and B. Then its capacity can be roughly checked by plugging the instruments mains lead into the mains and connecting the condenser across B and F. Let us suppose for the sake of illustration, that the leakage resistance is found to be 100,000 ohms; this would not matter greatly if the condenser was used in parallel with a resistor of only a few hundred ohms, but, of course would be serious if the condenser was used across a high value resistor.



VALVE VOLTMETER FOR TESTING

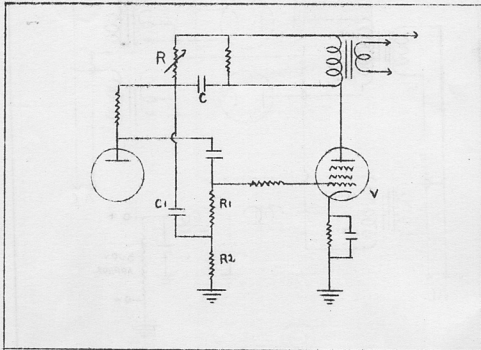
Especially care must be taken about insulation. The limiting resistance should be of such value that the 5 m/a meter reads just full scale when A is joined directly to B. The tests possible are A to B high resistance measurements; B to E, AC voltage without DC in circuit; D to E, AC voltage with DC in circuit; B to E, DC voltages in AVC circuits; E to C, higher DC voltages or higher AC voltages without DC in circuit; B to F inductive and capacity with 6v 50 c/s supply from transformer.

Many uses and variations of this simple instrument will suggest themselves to an experimenter of ingenious mind. Simply as a DC valve-voltmeter using the terminals E and B or C, it will for instance reveal the presence of AVC voltages; as an AC voltmeter across terminals E and D, it can be used as an output meter to measure the voltage developed across the speech coil of a loud speaker.

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TONE CONTROL

In the type of tone control where a series resistance and capacity are shunted across the load circuit of the output valve and the upper cut off frequency is usually fixed, so that the attenuation can only be varied above this point. In such a circuit arrangement the resistance is always the variable element.



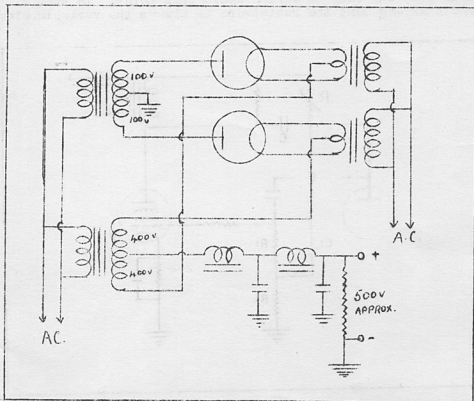
According to an invention patented by the Mullard Radio Valve Co., tone control is effected by using a negative feedback derived from a resistance-capacity circuit RC shunted across the output of a penthode V, the control grid of which includes a

(continued on page 5)

CONNECTING DISSIMILAR PLATE TRANSFORMERS IN SERIES

Ray Wheadon in QST suggests the use of the circuit shown to save the problem of connecting unlike transformers in series to obtain higher voltage. When identical transformers are connected in series, no problem is involved, since the centre-tap is easily obtained at the junction of the two identical secondaries. When dissimilar transformers are used, a centre-tap is impossible and the only means of using such a combination has been by the use of the bridge rectifier system which requires no centre-tap but does require four rectifier elements.

In the system suggested, only two rectifier elements are required but each filament must be insulated from the other.



Double rectifiers, like the type 83, may be used by connecting plates in parallel and using a separate tube for each element as shown in the circuit. Balanced output is obtained by connecting one of the transformer secondaries in the rectifier so turn leads and using both centre-taps. As with

any series arrangement, the transformer on the positive side must have sufficient insulation to take care of the extra voltage. Correct polarisation of the primary windings is required. This can be determined by trial. Incorrect polarisation will result in bucking voltages.

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(Tone Control - continued from page 3)

a potentiometer, R1, R2. The reverse feedback is applied from the variable control resistance R to the midpoint of R1, and R2 through a blocking condenser C1.

With increasing frequency, the reactance of the condenser C decreases, and a larger negative feed-back is therefore applied to the amplifier. The amount of feed-back will also depend on the setting of the resistance R, which thus governs and high frequency cut-off point. The attenuation above this point is, however, substantially constant.

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FURTHER PERSONAL NOTES OF NEW FEDERAL EXECUTIVE

Federal Vice President, Alan Joscelyne, VK2AJQ. Alan is a comparative new-comer to Amateur Radio, having received his ticket a couple of years prior to the outbreak of war. Has been a Member of the Divisional Council for sometime now, occupying the position of Vice President and Magazine Manager. Prior to his election to the Divisional Council, had much experience on the executive side of Radio as a member of Zero Beat Radio Club.

Federal Secretary, Wal Ryan, VK2TI. Wal has been a Member of the State Council since 1936 and during that time has occupied the positions of Secretary, Vice President, Publicity Officer and President of the Division. Was Contest Manager for the 1938 VK-ZL Dx Contest. Obtained ticket in 1935 and started off with an 830 in the final and finished up with a pair of 808's Receiver used was 10 tube super with xtal filter modelled on the Hammarlund Super Pro. 95 Countries have been worked and 89 verified has obtained W.A.S., W.B.E. W.A.C. both fone and cw and worked 37 Zones. Transmissions have been made on all bands and was the winner of the Australian Section of the 1938 A.R.R.L. Dx Contest.

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D I V I S I O N A L N O T E S

- New South Wales Division -

by VK2TI

The September General Meeting of the Division was held at the Y.M.C.A. Buildings before a much smaller attendance than usual.

Two interesting visitors were Messrs. Ray Carter 2HC and Clarrie Castle 5KL both of whom are now members of the R.A.A.F. 5KL handled bushfire traffic during the inferno that swept Victoria and South Australia a few years ago, and at that time his work was favourably commented upon. In private life he used to operate the radio at the base of a large carrying company operating through Central Australia and his anecdotes were much appreciated by members. I don't think it would be out of place to repeat two of them here:- As to be expected the company owned quite a few large trucks, and upon one occasion a thirty seven foot ten wheeler became stuck in the creek, and in their efforts to get it out the crew were unfortunate enough to break a tailshaft. A spare was fitted and met the same fate. Eventually it was decided to radio the base and an oxy-welder came out with his plant and as the tailshafts snapped he welded them. On another occasion a six tonner stripped its clutch and new clutch plates were made on the spot from an oil drum! -- "Where there's a ham there's a way."

Members will be pleased to learn that Lieutenant D.B.Knock 2NO has been discharged from hospital and is now enjoying a few weeks leave prior to rejoining his unit. Whilst in hospital Don considers he has designed the ultimate in 5 metre rigs both transmitter and receiver, but won't hazard a guess as to when he will be able to try it out. Don't worry Don you have quite a few mates!

The Institute has been a strong supported of Air Force House since its inauguration in VK2 and recently the Division was elected to Membership of Air Force House Association in appreciation of its work.

Another member of the Divisional Council to join the R.A.A.F. is Jack Howes VK2ABS. Jack was Technical Officer and the various Talks and Demonstrations arranged by him will be sorely missed by members.

Momentous changes are to take place in the Amateur Frequencies in the States. Commencing September 300 kcs of the 75 metre band will be taken over for the use of the Services. In order to compensate for this loss 7200-7300 kcs are to be thrown open to fone. Wonder how W6BKY will sound on forty.

We don't know whether there is any truth in this statement, but it has been rumoured that 3RJ and 2YC are to lead a deputation in protest to the F.C.C. !

FEDERAL EXECUTIVE

COUNCILLORS. Harold Peterson 2HP and Bill McElrea 2UV---2HP has been a member of the Divisional Council since 1936 occupying the position of President until this year when ill health has curtailed his activities quite a lot, necessitating his resignation from that office. Is quite well known throughout the DX world having obtained W.A.S. W.A.C. fone and CW and modestly refrains from telling us the number of Countries worked.

Will McElrea is at present the Divisional Treasurer and has had previous experience on the Council as Assistant Secretary. From the short sketches Members of the Institute throughout the Commonwealth will realise that as in the past Amateur Radio will have at its head for the ensuing period men well versed in all branches of the hobby.

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VICTORIAN DIVISION

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Members are asked to note that on account of Tuesday, 4th November being Cup Night, the usual meeting will be held on Wednesday night, November 5th.

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An item of interest to amplifier enthusiasts is the competition being conducted by the Australian DX Radio Club in conjunction with the "Listener IN." This competition should be of much interest to many of our members, as now most of their radio activity is confined to audio work. A fee of 2/6 per entry is being charged, the proceeds of which are to go to swell the Lord Mayors Comfort Fund.

There are two sections which will interest our members -
Section 1. Public Address Amplifier, any wattage output.
Section 2. Amateur Home Constructed, not exceeding 10 watts.
The closing date of the competition is the 15th of November, and the final judging will take place on the 29th of November. Anyone wishing to obtain further information on the subject can do so by getting in touch with Mr. N. H. Groves, 135 Burgundy Street, Heidelberg. N.22.

At the next meeting, which will be held on Wednesday 5th Novem. Mr. G. W. Manning 3XJ is to bring along an amplifier and a folded horn speaker which he has constructed. The improvement in tonal quality is outstanding George claims, and the demonstration should prove very interesting. If anyone cares to bring in his amplifier George will have very much pleasure in hooking it up to his speaker. The input tranny on the speaker, by the way is a single ended 5000 ohms as the output tube in the amplifier is a 6V6G.--So fellers roll along and pass your opinion both on the quality of reproduction and -- the quality of the home carpentry.

3XZ.. is now back at HQ Sigs Office and is sorting out the bits and pieces of an automatic transmitter.

3XJ.. is building an amplifier .. 6J7 and 6V6G, and has made a crystal pickup from a few bits and an Xtal cartridge. Seems to me as if George is rather a handy man 'bout the house. But George what's this about all the "LETTUCE GREEN" ?

3RN.. says that all his interests these days are confined to gardening and the building of an electric clock. (He also says something about the notes editor). I do believe that he is often woken up in the small hours of the morning.

3TE.. has for some time been constructing an electric clock (ye Gods .. another of 'em), which believe it or not, works perfectly, and will soon be placed in the hall.

3HX.. thinks he must have started something when he made the report that electric clocks were popular...he's now beginning to wonder what the outcome is going to be ???

3VM.. has produced issue, to wit..one female who it is alleged readily responds to CQ. Congrats OM.

3WQ.. also reports the arrival of a junior op..Congrats Chas.

3LQ.. has been transferred to S.A.

3RX.. had to resign from his job as instructor. Hence the frantic (?) appeal of last month.

From Laverton we learn that:- 3DG is a D/F operator.

3TD.. is on the Xmitters.....as well as 3QZ.

3XB.. is also a D/F op...bearings guaranteed or signal back.

3IN.. operates in aircraft...3 UC...D/F op bearings reported to be ALWAYS right...particularly in regard to Yank signals.

**THE WIRELESS INSTITUTE
OF AUSTRALIA
VICTORIAN DIVISION**

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Meeting Night—First Tuesday in each month.

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OF AUSTRALIA
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The Division meets on the Third Thursday of each month at Y.M.C.A. Buildings, Pitt Street, Sydney, and an invitation is accorded to all Amateurs to be present.

H A M S !

**DO YOU WANT TO BE
BACK ON THE AIR?**



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OF AUSTRALIA**

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